

at least one conductive trace disposed on said first dielectric material layer and in electrical contact with said microelectronic die active surface, wherein said at least one conductive trace extends adjacent said microelectronic die active surface and adjacent said encapsulation material surface; and

at least one heat dissipation device in thermal contact with said microelectronic die back surface.

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39. (New) The microelectronic package of claim 38, further including:

at least one additional dielectric material layer disposed over said at least one conductive trace and said first dielectric material layer, wherein at least a portion of said at least one conductive trace extends through and resides on said at least one additional dielectric material layer.

40. (New) The microelectronic package of claim 39, wherein said encapsulation material is adjacent at least a portion of said at least one heat dissipation device.

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on August 13, 2002, and the documents cited therewith. Claims 38-40 have been added by this amendment. Claims 1-4 and 24-40 are currently pending.

Applicant respectfully disagrees with the Office's characterization of the definition of a trace. Applicant further respectfully disagrees with the Office's characterization of the definition of the term of art "contact" as set forth in claim 1, "in electrical contact with"

Applicant searched extensively for the source of the definition of trace provided by the Office. Applicant could not find the source of this definition:

trace-a conducting connection between electronic components. May also be called a track or a signal. In the case of integrated circuits, such interconnections are often referred to collectively as metallization.

(Office Action at page 4). Applicant notes, however, that this definition refers to a trace in the singular, "a conducting connection". Next the definition lacks an antecedent for the following term, in the plural, "such interconnections are often referred to collectively as metallization."

(Office Action at page 5). This definition suffers from a disconnect between the singular term "a connection" and the plural term "such interconnections". But without further information, Applicant respectfully asserts that the definition provided by the Office, defines a trace as a connection in the singular, and metallization as a collection of "traces", "such interconnections" (ibid.) in the plural. Because Applicant teaches and claims a trace, and the cited reference teach only "metallization", withdrawal of the rejections is respectfully requested.

Regarding the next definition of trace provided by the Office, it appears the Office obtained the definition from the web site, "Computer, Telephony & Electronics Industry Glossary" (<http://www.csgnetwork.com/glossaryt.html>).

trace 1. A line or "wire" of conductive material such as copper, silver or gold, on the surface of or sandwiched inside a PCB, printed circuit board. These traces are often called individually a run. Traces carry an electronic signal or other forms of electron flow from one point to another. Traces that are on the surface of a board are covered with a non-conductive coating, except at contact or solder points, to keep unintentional contact from being made with other conductive surfaces.

Applicant respectfully asserts that the phraseologies "on the surface of" and "sandwiched inside", call to mind significant and major portions of elongate and laterally running structures, and not the construction provided in the Office Action. Applicant notes that claim 1 requires a "trace . . . in electrical contact with said microelectronic die active surface . . ." (Claim 1.). Applicant notes the same on-line dictionary provides the following definition for "contact".

contact 1. A point of junction in an electrical circuit. By mechanical or electrical means, they can be switched, on or off, closed or open. Contacts that when "closed" connect a pair of wires together and disconnects the wires when "open". A doorbell button is a simple example of a momentary contact closure.

("Computer, Telephony & Electronics Industry Glossary")

(<http://www.csgnetwork.com/glossaryc.html>). If the Office is to maintain the definition of "trace" provided by the Computer, Telephony & Electronics Industry Glossary, Applicant respectfully insists the term "contact" as used in claim 1, requires a junction in an electrical circuit. None of the cited references teach or suggest a

. . . trace (singular) disposed on said first dielectric material layer and in electrical contact (point of junction) with said microelectronic die active surface

(Claim 1.). Withdrawal of the rejections is respectfully requested.

Rejections Under 35 U.S.C. §102

In the Office Action, claims 1-3, 25-29, 31-34, and 37 were rejected under 35 U.S.C. § 102(a) as being anticipated by Chung (U.S. 6,288,905). The Applicant respectfully traverses the rejection and requests the Office to consider the following.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (*Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), M.P.E.P. §2131, 8th Ed.).

The Office Action mistakenly asserts "at least one conductive trace 134, 132, 110 (col. 10, line 40-50 . . .) is shown disposed on said first dielectric and in electrical contact with said active surface" (Office Action, at page 2). Claim 1 requires "at least one conductive trace disposed on said first dielectric material layer and in electrical contact with said microelectronic die active surface" Chung's trace (metal layer 110) is in electrical contact with the "via conductor 132b" and not with the active surface. Further, Chung's via conductor 132b is in electrical contact with the "oxidation-resistant material 134b" and not with the active surface. Even further, Chung's oxidation-resistant material 134b is in electrical contact with the "bump 144" and not with the active surface. It is only Chung's bump 144 that is in electrical contact with the active surface at the "contact pad 142b".

The Office Action attempts to construe two elements into a form that is repugnant to ordinary usage and logic. First, a "trace" is well known to be a uniform metal or doped

semiconductive structure, a significant portion of which is elongated and runs laterally ("on the surface of or sandwiched inside" definition provided by the Office Action) when viewed in proper cross-section. Only Chung's "metal layer 110" could qualify as a trace, and it is not in electrical contact with the active surface. Second, "in electrical contact" is well known to mean one structure physically touching, i.e. an electrical "junction" (definition taken from the same glossary provided by the Office Action, supra) with another structure. Thus, Chung's "trace" (metal layer 110) is only "in electrical contact" with the "via conductor 132b". It is true, however, that Chung's "trace" (metal layer 110) may be electrically coupled to the active surface, but only through electrical contact with the "via conductor 132b", which is in electrical contact with the "oxidation-resistant material 134b", which is in electrical contact with the "bump 144", which finally (and solely) is in electrical contact with the active surface at the "contact pad 142b". Because each and every element of claim 1 is not taught by Chung, withdrawal of the rejection is respectfully requested.

Claim 2 adds the limitation of "at least one additional dielectric material layer disposed over said at least one conductive trace". The Office Action asserts a "dielectric 120 is shown disposed over said one trace." (Office Action, page 2). The Office Action is mistaken. The dielectric 120 simply is not disposed over the "trace" (metal layer 110). Even where the Office action has misconstrued the trace as including "the via conductor 132b" or the "oxidation-resistant material 134b", the "dielectric 120" is not disposed over the conductive trace, but perhaps "next to" or "at", etc. Finally, where the dielectric 120 may be disposed over the bump 144, it is repugnant to ordinary usage to construe a bump as a trace. Because each and every element of claim 2 is not taught by Chung, withdrawal of the rejection is respectfully requested.

Claim 3 adds the limitation that "at least a portion of said at least one conductive trace extends through and resides on said at least one additional dielectric material layer." The Office Action asserts that the "via conductor 132b" is the trace. But this assertion is a mistake as set forth above. In any event, the "dielectric material 120" is not above the "trace" (metal layer 110). Because each and every element of claim 3 is not taught by Chung, withdrawal of the rejection is respectfully requested.

The Office Action asserts that Chung further teaches what is claimed at Figure 14. The

Office Action is mistaken. Chung confirms that, other than the connectors 160, it is "otherwise similar to contact module 100 of FIG. 6 in construction and materials" (Chung at column 11, lines 57 et seq.) Even if Chung at Figure 14 could be construed to include the conductor 160 as the trace as claimed by Applicant, the conductor 160 suffers from the same defect of not being in electrical contact with the microelectric die active surface (see Figure 13), as the conductor 160 is in electrical contact with the "via conductor 132b" which in turn is in electrical contact with the "bump 144", which alone is in electrical contact with the active surface. Because each and every element of what is claimed is not taught by Chung, withdrawal of the rejection is respectfully requested.

Regarding claim 26, Chung utterly fails to teach the limitation "encapsulation material includes. . . at least one surface planar to said microelectronic die back surface." Because each and every element of claim 26 is not taught by Chung, withdrawal of the rejection is respectfully requested. Because claims 27-29 depend from claim 26, withdrawal of their rejections is also respectfully requested.

Regarding claim 31, Chung also fails to teach the encapsulation material is "substantially planar to said plurality of microelectronic dice active devices" (claim 31). This can be verified by review of FIGS. 13 and 14 where the encapsulation material (not present in FIG. 13) would fill to a level above the active surface, and where the encapsulation material (not labeled in FIG. 14) can possibly be construed to be substantially planar to the active surface of die 140 on the left edge, but nowhere else by virtue of the presence of the conductor 160 in that position. Because each and every element of claim 31 is not taught by Chang, withdrawal of the rejection is respectfully requested. Because claims 32-34 and 37 depend from claim 31, withdrawal of their rejections is also respectfully requested.

In the Office Action, claims 1, 26, 27, 31, and 32 were rejected under 35 U.S.C. § 102(b) as being anticipated by Fordemwalt (U.S. 3,407,479). The Applicant respectfully traverses the rejection and requests the Office to consider the following.

Regarding claim 1, Fordemwalt fails to teach at least one limitation of claim 1, "at least one conductive trace disposed on said first dielectric material layer and in electrical contact with said microelectronic die active surface". Fordemwalt also fails to teach at least one limitation of

claim 1, "wherein said at least one conductive trace extends adjacent said microelectronic die active surface". Fordemwalt also fails to teach at least one limitation of claim 1, "wherein said at least one conductive trace extends . . . adjacent said encapsulation material surface". Because each and every element as set forth in claim 1 is not found, either expressly or inherently described, in Fordemwalt, withdrawal of the rejection is respectfully requested.

Regarding claim 26, Fordemwalt utterly fails to teach the limitation "encapsulation material includes. . . at least one surface planar to said microelectronic die back surface." Because each and every element of claim 26 is not taught by Fordemwalt, withdrawal of the rejection is respectfully requested. Because claim 27 depends from claim 26, withdrawal of its rejection is also respectfully requested.

Regarding claims 31 and 32, Fordemwalt fails to teach at least the limitation, "at least one conductive trace disposed on said first dielectric material layer and in electrical contact with said microelectronic die active surface". Fordemwalt also fails to teach at least the limitation "wherein said at least one conductive trace extends adjacent said microelectronic die active surface". Because each and every element is not found, either expressly or inherently described, in Fordemwalt, withdrawal of the rejection is respectfully requested.

In the Office Action, claims 1, 26, and 27 were rejected under 35 U.S.C. § 102(a) as being anticipated by Nishihara et al. (U.S. 6,013,953). The Applicant respectfully traverses the rejection and requests the Office to consider the following.

The Final Office Action insists in citing to an "encapsulation 18" (Office Action, page 3) that does not exist in Nishihara et al. The only reference to the numeral 18 is with respect to "18 pieces of copper" (Nishihara et al. at col. 7, line 11). Because the rejection is incomprehensible, it should be withdrawn.

The other limitations cited in the Office Action may describe what is disclosed in Nishihara et al., but claim 1 requires "at least one conductive trace disposed on said first dielectric material layer and in electrical contact with said microelectronic die active surface" Nishihara's trace (copper through-hole 5) is not disposed on the first dielectric material (adhesive 3). Further, Nishihara's trace is not in electrical contact with the active surface, rather with a "connection terminal 9" that is prominent from the active surface. Because the rejection is

incomprehensible, and because each and every element as set forth in claim 1 is not found, either expressly or inherently described, in Nishihara et al., withdrawal of the rejection is respectfully requested.

Regarding claim 26, Nishihara et al. utterly fail to teach the limitation "encapsulation material includes. . . at least one surface planar to said microelectronic die back surface." Because each and every element of claim 26 is not taught by Nishihara et al., withdrawal of the rejection is respectfully requested. Because claim 27 depends from claim 26, withdrawal of its rejection is also respectfully requested.

In the Office Action, claims 1, 4, 24, 26, 27, 30, 31, 32, 35, and 36 were rejected under 35 U.S.C. § 102(b) as being anticipated by Donovan (U.S. 3,343,255). The Applicant respectfully traverses the rejection and requests the Office to consider the following.

The Final Office Action insists in citing to a "first dielectric 123" (Office Action, page 4) that does not exist in Donovan. Because the rejection is incomprehensible, it should be withdrawn.

The Office Action incorrectly refers to a "trace 32" that in fact is no more and no less than an "ohmic contact 32". The ohmic contact 32 cannot be construed to be a trace as claimed, let alone to have the limitations of the trace as claimed. Because each and every element of claim 1 is not taught by Donovan, withdrawal of the rejection is respectfully requested.

Claims 4 and 24 depend from claim 1 and are therefore not anticipated. Further, Donovan fails to teach the limitation of claim 24, particularly the limitation the "said encapsulation material is adjacent at least a portion of said at least one heat dissipation device." Withdrawal of the rejections is respectfully requested.

Regarding claim 26, Donovan utterly fails to teach the limitation "encapsulation material includes . . . at least one surface planar to said microelectronic die back surface." Because each and every element of claim 26 is not taught by Donovan, withdrawal of the rejection is respectfully requested. Because claim 27 and 30 depend from claim 26, withdrawal of the rejections is also respectfully requested.

Regarding claims 31 and 32, Donovan fails to teach at least the limitation, "at least one conductive trace disposed on said first dielectric material layer and in electrical contact with said

microelectronic die active surface". Donovan also fails to teach at least the limitation "wherein said at least one conductive trace extends adjacent said microelectronic die active surface".

Because each and every element is not found, either expressly or inherently described, in Donovan, withdrawal of the rejection is respectfully requested. Because claims 32, 35, and 36 depend from claim 31, withdrawal of its rejection is also respectfully requested.

Rejections Under 35 U.S.C. § 103

In the Office Action, claims 4, 24, 35, and 36 were rejected as being unpatentable over previously cited references. The Applicant respectfully traverses this rejection and requests the Office to consider the following.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (M.P.E.P. § 2143 7th Ed).

In addition, the Federal Circuit has held that "If the examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent. *In re Oetiker*, 24 USPQ 2d 1443, 1444 (Fed. Cir. 1992).

The Applicants incorporate all the discussion regarding the inadequacy of the previously cited references to teach each and every element of what is claimed.

The Office Action admits that Chung and Fordemwalt et al. do not teach a heat dissipation device. However, what teaching Donovan et al. adds to teach a heat dissipation device, does not amount to a teaching or suggestion of all the limitations of claims 4, 24, 35, and 36 as set forth in this Reply. Further, where heat dissipation (or heat dissipation at all, for that matter) is not mentioned in Chung and/or Donovan et al., the Office Action has used the

AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.116 - EXPEDITED PROCEDURE

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Dkt: 884.792US1

Applicants' disclosure as a guide to make the claimed combination. Withdrawal of the rejections is respectfully requested.

In the Office Action at page 5, claims 1-4 and 24-37 were rejected. Because the statutory basis for this rejection was not stated, the rejection is incomprehensible and the rejection should be withdrawn. (M.P.E.P. §707.07(d)). In M.P.E.P. §707.07(d), it states, "[t]he examiner should designate the *statutory basis* for any ground of rejection by express reference to a section of 35 U.S.C. in the opening sentence of each ground of rejection." (Underlined emphasis added).

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney John Greaves at 801/278-9171 or the below signed attorney to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Box RCE, Commissioner of Patents, Washington, D.C. 20231, on this 13th day of February, 2003.

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